

European Money Market Reform



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Following the COVID-19 related market disruptions in March 2020, policymakers around the world have been focused on drawing lessons and conclusions from the market turmoil to help improve the resilience of various financial products and market structures. Money Market Funds (MMFs) were one of the first areas of focus, with the Financial Stability Board (FSB) and International Organisation of Securities Commissions (IOSCO) bringing together work by US, European and other regulators that focused on their respective MMF industries and how they coped with the redemption pressures of March 2020.

While the FSB's final report¹ presents a menu of reform options ranging from prudential, bank-like regulation to more targeted amendments to the existing regulatory framework for MMFs, there is a recognition that different jurisdictions will approach reform from different perspectives: representing the specificities of the market structure, range of MMF product offerings and variations in existing regulatory frameworks.

We welcome this approach; as we outlined in our 2020 ViewPoint, [Lessons from COVID-19: The Experience of European MMFs in short-term markets](#), there was no one single market event or pressure on 'MMFs' as a whole in March 2020. There were in fact a range of different factors at play across different currencies, jurisdictions, investor types and types of MMFs. Equally, the lessons to be drawn on how to improve the regulatory frameworks vary between jurisdictions, where often, key features of MMFs differ.

In parallel with global efforts, the European regulatory framework implemented in 2019, the EU Money Market Funds Regulation (MMFR), is under review this year. To support this review, three official opinions were compiled by the European Central Bank (ECB)², European Systemic Risk Board (ESRB)³ and European Securities and Markets Authority (ESMA)⁴. While these contributions are advisory, and do not oblige the European Commission to take any specific action, they will of course be influential on the process as it moves forward.

Each of these opinions make recommendations that are widely supported, and which we agree can help enhance the resiliency of MMFs, in particular:

- Reducing threshold effects related to potential breaches of weekly liquid asset minimums is a near universal recommendation across all official-sector reports and recommendations as well as industry assessments of key vulnerabilities in March 2020;
- Requiring MMFs to incorporate a liquidity management toolkit that is appropriate to the fund and the prevailing market conditions; and
- Enhancing reporting requirements to ensure that supervisors and regulators have more granular and frequent data relating to individual MMFs, and by extension, the market.

Each report also raises the important topic of the calibration and composition of MMFs' liquidity buffers, which is central to an MMF's ability to meet redemption pressures, and hence, underpin MMF resilience.

The opinions expressed are as of December 2022 and may change as subsequent conditions vary.

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Perhaps the most politically significant area that these opinions explore is around reforms to the Low-Volatility NAV (LVNAV) fund structure, which today represents close to 50% of the AUM in European MMFs. The ESRB and ESMA opinions propose dramatic reforms to the LVNAV fund structure, which if carried through, would turn it into another Variable NAV (VNAV) fund structure alongside the other VNAV structures established by the MMFR.

In this paper, we take a closer look at the LVNAV fund structure and the calibration and composition of liquidity buffers. We also look beyond the events of March 2020, to the more recent experience of European MMFs as central banks around the world moved to raise interest rates in 2022. How European MMFs fared during this market volatility provides further important lessons for the reform debate, which, given the timing of the FSB work and ESRB and ESMA opinions, were not reflected in their recommendations.

Summary of recommendations

LVNAV resilience

- LVNAV MMFs are an important tool for many investors. While they were tested during the liquidity crisis brought about by COVID-19 in March 2020 and in subsequent stress market events, these MMFs performed well. **The notable outflows that many LVNAV MMFs managed at times during these episodes are not a sign of a lack of resilience, but rather, evidence of a high degree of resilience**, as they were able to continuously provide liquidity to investors who needed it.
- The ESMA and ESRB opinions, while not recommending the outright elimination of the LVNAV structure, would have the effect of turning them into VNAV MMFs. This would create a confusing regulatory regime with, essentially, three distinct VNAV MMFs, each with combinations of different maturity and liquidity profiles, yet all three marketing themselves as MMFs, and each with daily redemption profiles.
- We see **no evidence of an inherent pricing cliff edge in the LVNAV structure** borne out in any market stress episodes since the regime came into force. We do, however, believe that the **operational resilience** of LVNAV MMFs – in particular, requiring more clarity around how a fund would deal with a breach of the 20bps pricing ‘collar’ that requires it to change its dealing price – **can and should be further enhanced**.
- Without evidence of a clear inherent risk in the LVNAV structure, we believe eliminating it as a viable option for European investors would be highly detrimental. In a world where the movement of cash throughout the financial system on an intraday basis is increasingly important, in part a consequence of regulatory requirements, reducing the availability of a highly liquid, transparent and well-regulated cash management product would make cash and liquidity management more difficult for a wide range of market participants.
- In fact, as interest rates likely continue to rise in the near future, the potential for price movements in fixed income markets makes the LVNAV even more valuable to investors.

Liquidity buffers

- **Liquidity buffers should be the focal point for policymakers** when seeking to ensure that MMFs are resilient to simultaneous outflow pressures and market-wide liquidity events. Daily Liquid Assets (DLA), cash on hand during the day, are the way in which MMFs typically fund redemptions; and Weekly Liquid Assets (WLA) are a measure of an MMF portfolio’s ability to organically replenish DLA in the near term.
- DLA buffers need to be **sufficient to meet even significant outflows**, but **not so onerous that an MMF would struggle to place cash overnight** in all market conditions.
- Looking at outflow across European short-term MMFs in **March 2020, the current 10% minimums in the MMFR were sufficient to meet redemptions** even in stressed conditions. However, we believe it **would enhance MMF resilience to require all daily-dealing MMFs to hold 15% DLA**: we also believe it would be likely that MMFs could place this level of cash overnight consistently in all market conditions.
- **The case for minimum government debt buffers is less clear**. Government debt can, in certain circumstances, be an important liquidity management tool for MMFs. However, funds should not need to rely on the prospect of selling any type of asset to meet redemptions if DLA buffers are appropriately calibrated.
- A lack of supply of short-term government debt in Euro and Sterling would likely force MMFs to rely on the secondary market to maintain minimum allocations. **Regular price dislocation in these assets, when they become more expensive around quarter- and year-end, would mean importing price volatility when there will often be far more efficient ways to manage liquidity**.
- Policymakers should prescribe realistic minimum levels of liquidity, and give MMF managers appropriate tools, flexibility and discretion to manage around changing liquidity conditions rather than forcing funds to hold liquidity in the same prescriptive way in all market conditions, which risks creating new vulnerabilities.
- Finally, the **threshold effect from the direct link between a breach of the WLA minimums and the possible imposition of redemption gates/fees should**

be addressed. This can even take the form of supplementary supervisory guidance which should make clear that the imposition of a liquidity management tool (likely a liquidity fee in the case of MMFs) is not automatic in the case of a breach, only if the situation warrants it. Furthermore, guidance should specify that gating is an option of last resort.

Ecosystem improvements

- Elements of both the events of March 2020 and the recent UK gilt market turbulence highlighted the fact that **margin and collateral requirements frequently drive outflow pressures on MMFs.**
- It is important to note that **MMFs play an important role to help underpin financial stability** in these episodes by continuing to provide liquidity to users, despite the clear outflow pressures placed on the funds.
- Both episodes highlight the value of finding ways to **increase the transferability of MMF shares where they are used as liquidity stores for users with margining and collateral needs.**
- By facilitating the use of MMF shares as collateral in clearing and margining arrangements, there would be less need for the process of moving cash for margin purposes to require a redemption from the MMF. In times of market stress where many or all of a particular MMF user segment face acute margin pressure, this would also dramatically reduce the resulting outflow pressures on MMFs.

- Increasingly, it is *technologically* possible to do this, but regulatory barriers remain. As regulators, particularly those in Europe, look at the margin and collateral framework in the near future (in response to the recent issues in energy markets, and with UK pension funds), finding regulatory solutions to facilitate this would help mitigate the spill-over effects of these types of market events into money markets.

Focus on the LVNAV

The creation of the LVNAV MMF product structure was one of the most important developments of the MMFR. The structure moved credit (non-government debt) MMFs away from the existing Constant NAV (CNAV) structures that were a dominant feature of the short-term MMF markets up to that point.

A wide range of investors find the LVNAV MMFs highly valuable as they are able to preserve some of the utility of the old CNAV fund structures, in particular, the operational and accounting utility of a structure that allows some of the fund's *unrealised* mark-to-market price volatility to be rounded out of the share price. This means that investors do not need to recognise capital gains or losses that the fund itself has not realised, as they may need to do in a VNAV MMF.

However, both the ESRB and ESMA opinions make recommendations that would effectively eliminate the LVNAV structure⁵. **We do not believe this is warranted.**

CNAV and LVNAV MMFs at a glance

	Constant NAV (CNAV) MMFs*	Low-Volatility NAV (LVNAV) MMFs
Accounting (asset level)	Each security in the portfolio is valued using straight-line amortised cost accounting (ACA). This assumes a known price of the security at its maturity and evenly distributes income through the life of the security.	<ul style="list-style-type: none"> • Securities with a maturity of 75 days or less <i>may</i> be valued using straight-line ACA as long as the Mark to Market (MTM) valuation of the individual security is within 10bps of its amortised cost. • Remainder of portfolio must be valued using MTM valuation.
Dealing price (transactional NAV)	Investors can subscribe/ redeem at a share price rounded to 2 decimal places (normally 1.00).	Investors can subscribe/ redeem at a share price rounded to 2 decimal places (normally 1.00) <i>as long as</i> the full MTM LVNAV valuation is within a 20bps tolerance (collar). If the 20 bps is breached, the MTM NAV (i.e. the unrounded NAV) becomes the dealing price.
Pricing/ dealing tolerances	A CNAV MMF would 'break the buck' if its MTM fell below 0.9950 (50bps). (NB: Most external rating agencies had/ have a stricter tolerance for an MMF to maintain a AAA rating).	<ul style="list-style-type: none"> • If the LVNAV valuation breaks the 20bps (0.9980 – 1.0020) collar the transactional NAV will become the LVNAV's MTM valuation calculated to 4 decimal places. • This means that well before an LVNAV could ever 'break the buck', it would need to convert to deal at a VNAV, thus avoiding the cliff edge risk associated with breaking the buck.

* Before the EU MMFR, most short-term MMFs were CNAV funds; following the full phase in of the MMFR in 2019, only government debt MMFs are permitted to retain CNAV pricing/ dealing structures

The relationship between dealing, liquidity risk management and valuation

Most open-ended mutual funds (OEFs) – except for ETFs and MMFs – are designed to meet redemptions by selling assets from their portfolio. This is generally done by selling a representative sample of fund assets, rather than relying on cash or near-cash assets. As a result, OEFs typically hold low levels of cash: its purpose is for tactical investment opportunities, or functional purposes like derivatives margining (where applicable), not as a day-to-day liquidity buffer.

The redemption or subscription price of OEFs **must be a mark-to-market NAV**, because this is the price at which the fund expects to be able to sell assets to fund redemptions, and the price at which the fund would expect to buy additional assets with net subscriptions.

Anti-dilution mechanisms such as swing pricing or liquidity fees pass on the costs of accessing liquidity to the transacting investor. For example, explicit costs such as transactions costs and implicit costs such as market impact. These costs are reflected in the redemption/subscription price, minimising the risk of devaluing the stake of investors remaining in the fund. We outline this process in more detail in recent [Policy Spotlights on swing pricing](#) specifically, and [managing liquidity risk in investment funds](#) more generally.

MMFs, however, are designed to deal in a fundamentally different way, and this has important implications not just for the use of liquidity risk management tools, but on fund valuation as well.

MMFs typically fund redemptions through cash on hand, not by selling underlying assets. This is the fundamental and sole purpose of daily liquid asset buffers enshrined in regulatory regimes around the world – to ensure MMFs have enough cash on hand to meet even significant daily outflows.

The price of cash on hand does not fluctuate which means that the mark-to-market NAV is not relevant to the cost of funding redemptions or investing the proceeds from subscriptions, as this is the portion of the portfolio from which redemptions are funded.

Equally, funding redemptions with cash generates no transaction costs. This is important when considering liquidity risk management or anti-dilution tools. For example, while highly valuable for OEFs, swing-pricing is an entirely inappropriate liquidity management tool when a fund does not buy or sell assets to fund redemptions. Instead, MMFs need tools that can be used only in the extreme circumstance whereby a redemption cannot be funded in its entirety with cash on hand and the fund needs to sell assets to raise additional liquidity. For this purpose, a liquidity fee is the most appropriate tool.

Testing the ‘pricing cliff edge’ thesis

Both the ESRB and ESMA, in supporting their recommendations, assume that there is a pricing ‘cliff edge’ risk embedded in the LVNAV structure. That is, that investors would be more likely to redeem from an LVNAV fund the more the MTM value deviates from the rounded share price, to ensure they redeem before the fund breaches the 20bps collar, otherwise they would potentially be forced to realise a loss by redeeming at a lower share price.

The ECB outlines this hypothesis further in a recently published research paper⁶ whose conclusion was that in normal market conditions, MTM deviations did not lead to accelerated redemptions, but when underlying markets experienced stress, MTM deviations could lead to slight accelerations of redemptions⁷.

We do not believe this pricing cliff edge hypothesis is borne out by the data.

There have been three notable market tests of this thesis in recent years: 1) in the March 2020 COVID-related liquidity stress event; 2) at various points in each main currency during 2022 as central banks have begun accelerating interest rate rises, and 3) in the UK around the September/October 2022 gilt market volatility. In each instance, there have been examples of LVNAV MMFs whose MTM NAVs have deviated within the collar (sometimes notably, though we have not seen an LVNAV breach the 20bps threshold), and in each instance, it is difficult to find a clear redemption pattern one might associate with a pricing cliff edge effect.

1. March 2020 saw a significant liquidity shock across many different markets due to the COVID-19 related economic shutdowns. We wrote extensively about the nature, drivers and impacts of that shock in our 2020 ViewPoint, [Lessons from COVID-19: The Experience of European MMFs in short-term markets](#).

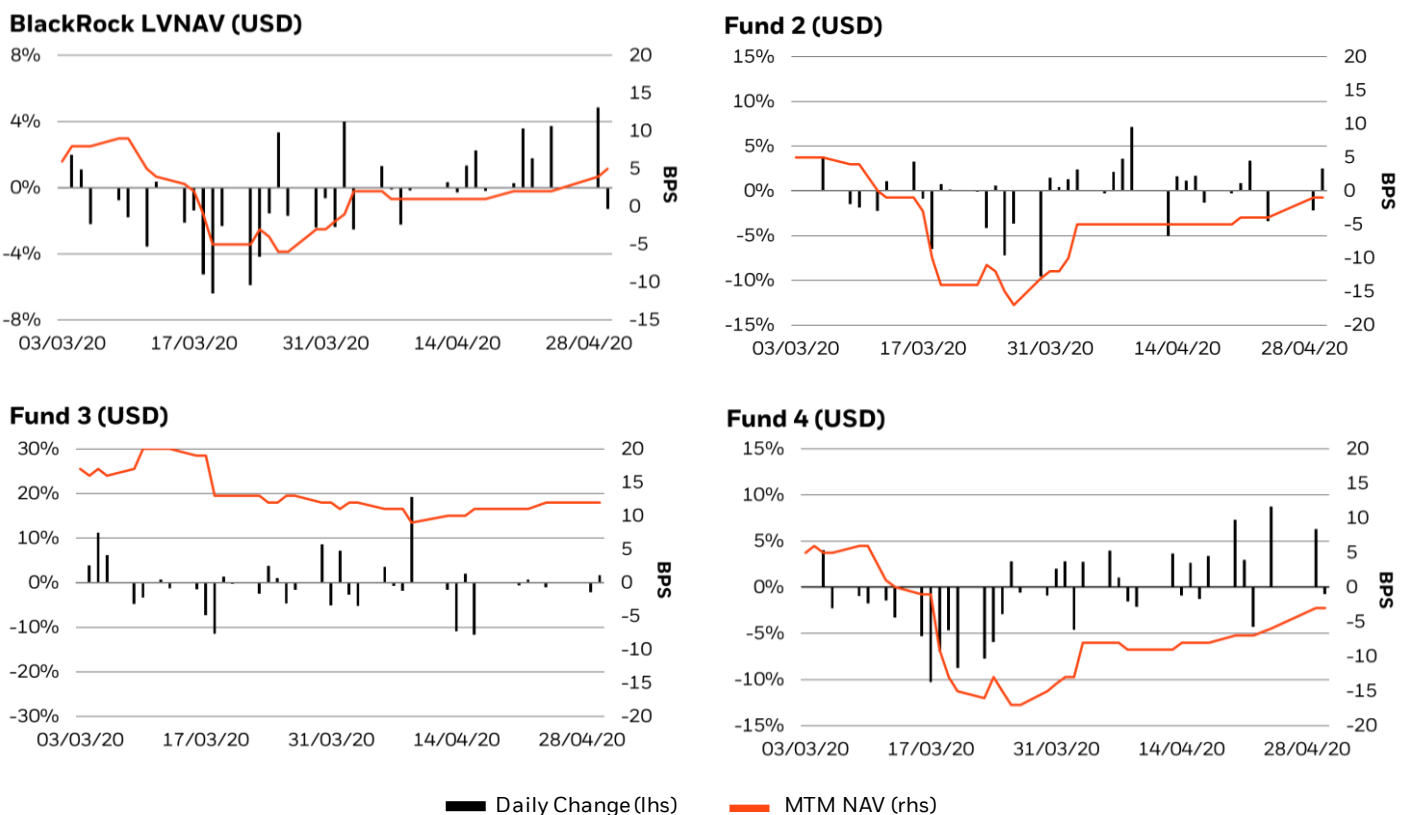
March 2020 was primarily a liquidity shock; while there was some MTM volatility in short-term markets, it was not uniform across currencies. The vast majority of the price volatility in short-term markets occurred in US Dollar (USD); price volatility was more muted in Euro (EUR), and in Sterling (GBP) LVNAVs, MTM NAVs were primarily above the rounded NAV throughout March and April 2020, that is MTM valuations were greater than the 1.00 rounded share price.

In **Exhibits 1-3** below, we set out the pattern of inflows and outflows in LVNAV MMFs set against the MTM deviations in March and April 2020. Across each of the three currencies (USD, EUR, and GBP), we show daily MTM price movements and net flows from our own (BlackRock) LVNAV MMF, as well as the MMFs which experienced the highest MTM deviations in that currency during that time period.

The flow patterns across all three currencies during March 2020 do not support the thesis of a pricing cliff edge inherent in LVNAV funds.

The suggestion has also been made that it was due to central bank interventions that the pricing cliff edge was averted for LVNAV funds. For each of the three currencies, we have also shown the respective start dates of central bank asset purchase programmes where short-term (<1 year maturity) securities became eligible. While central bank support for a wide variety of market segments and in some cases, direct support for issuers, undoubtedly had a calming effect overall on the market turbulence in March 2020, as we outline further in our 2020 ViewPoint, these asset purchases had little direct effect on European MMFs: USD denominated short-term assets purchased from European MMFs were not eligible for the U.S. Federal Reserve's Money Market Mutual Fund Liquidity Facility (MMLF), and both the Bank of England and ECB's short-term asset purchase programmes only covered corporate (non-financial) paper, which makes up an extremely small portion of LVNAV MMF assets⁸.

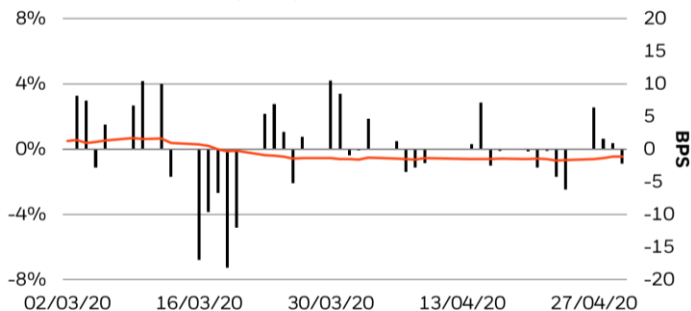
Exhibit 1: LVNAV outflows v. MTM deviations – March 2020 (USD)



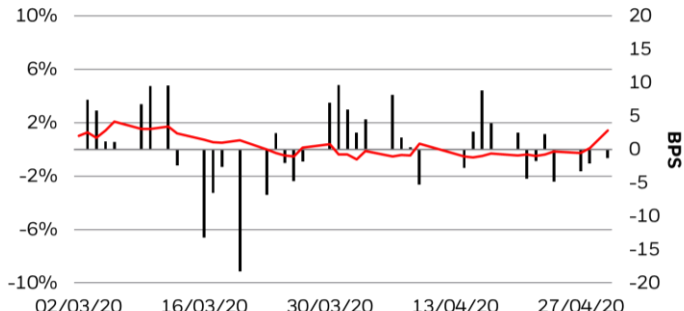
Source (all charts): Money Fund Analyzer-iMoneyNet/EPFR, BlackRock

Exhibit 2: LVNAV outflows v. MTM deviations – March 2020 (EUR)

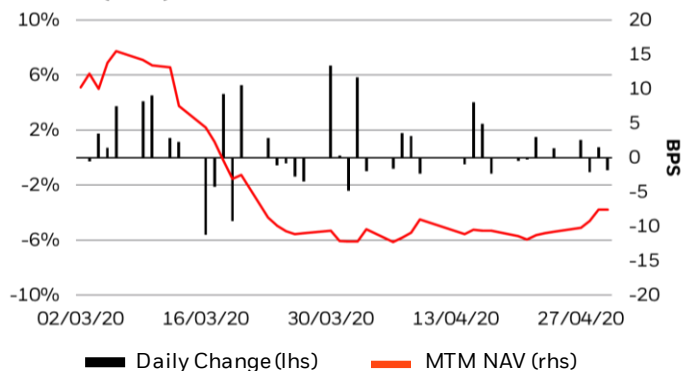
BlackRock LVNAV (EUR)



Fund 2 (EUR)



Fund 3 (EUR)

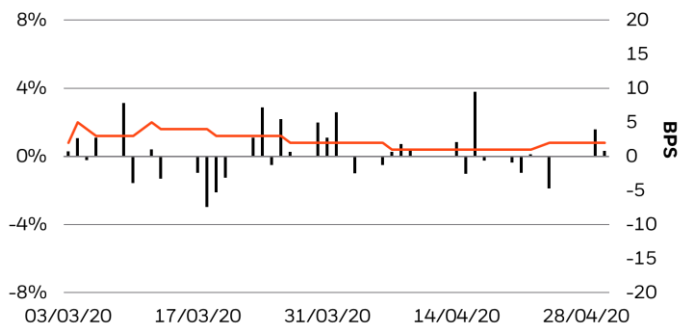


■ Daily Change (lhs) ■ MTM NAV (rhs)

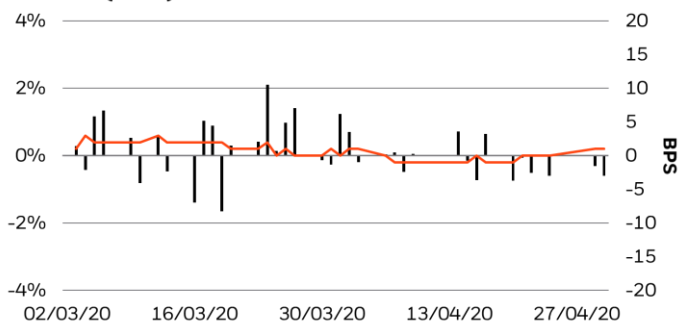
Source (all charts): Money Fund Analyzer-iMoneyNet/EPFR, BlackRock

Exhibit 3: LVNAV outflows v. MTM deviations – March 2020 (GBP)

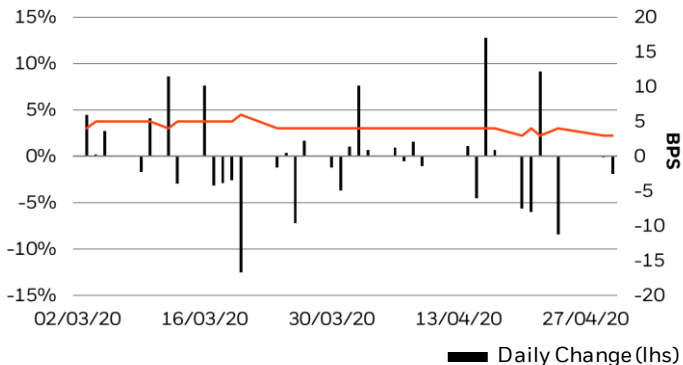
BlackRock LVNAV (GBP)



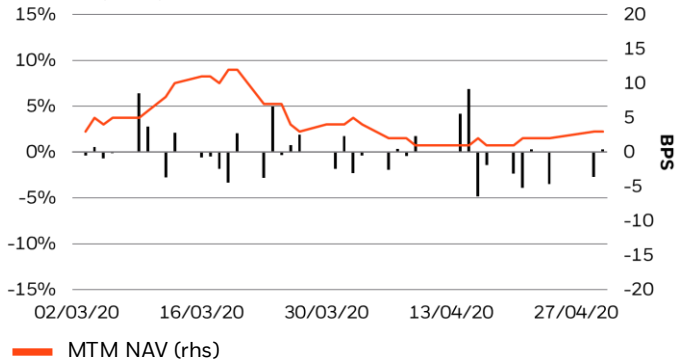
Fund 2 (GBP)



Fund 3 (GBP)



Fund 4 (GBP)



■ Daily Change (lhs) ■ MTM NAV (rhs)

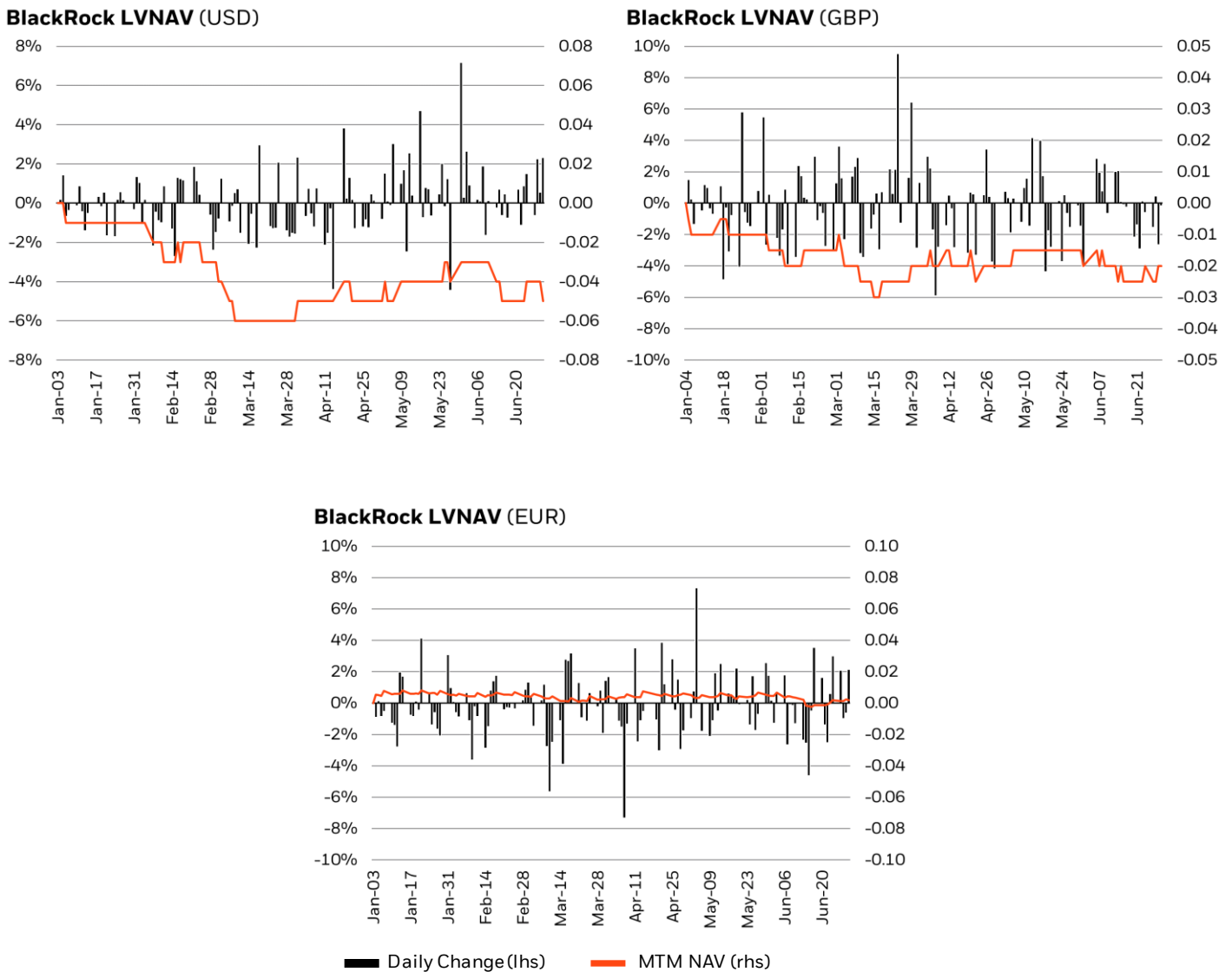
Source (all charts): Money Fund Analyzer-iMoneyNet/EPFR, BlackRock

2. The second test of the pricing cliff edge theory has been over the course of 2022 as central banks around the world began raising interest rates. Rate increases will usually result in a depreciation of the MTM value of outstanding debt securities. As MMFs, both VNAV and LVNAV, in all currencies position themselves for anticipated rate increases, they have often increased liquidity and shortened maturities of their portfolios to reduce MTM volatility. However, there are many instances of funds with sustained MTM deviations from the rounded price around rate increases, and no evidence of unusual redemption patterns from investors.

In **Exhibit 4** we show the MTM deviations experienced in our own (BlackRock) LVNAV MMFs over the course of H1 2022. While MTM movements in EUR remained small, there were sustained deviations in GBP and USD, reflecting the realities of rate increases by the Bank of England and the U.S. Federal Reserve, respectively. Despite deviations across a notable time period, we did not experience unusual redemption patterns.

The rising rate environment is in many ways the ideal backdrop to underline the utility of the LVNAV structure. As rate increases can create MTM pricing volatility, the value of a fund structure that does not automatically pass along *unrealised* capital gains or losses by being able to round off some of the volatility in the dealing price is significant.

Exhibit 4: LVNAV outflows v. MTM deviations (H1 2022)



Source (all charts): Money Fund Analyzer-iMoneyNet/EPFR, BlackRock

3. The most recent test of the pricing cliff edge theory has been in the recent UK gilt market volatility. On top of pricing moves in the market related to the Bank of England's rate increase on the 22nd of September, the UK Government announced plans for a "mini-budget" the following day which included additional planned borrowing, which led to significant price volatility in UK gilt markets.

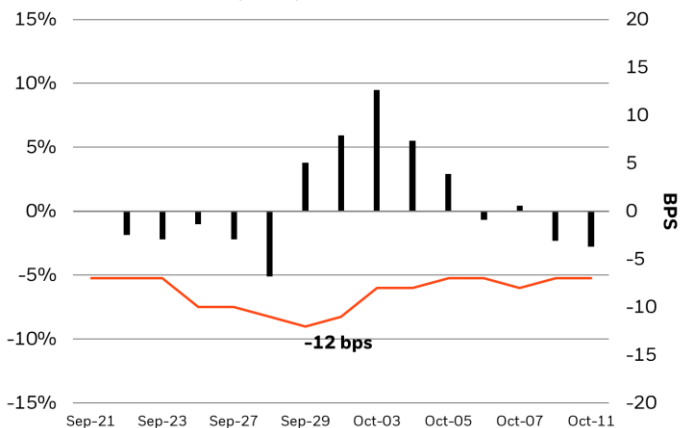
Despite much of the volatility being focused on longer-dated gilts, even short-term markets experienced price dislocations. Below, in **Exhibit 5**, we have shown the relationship between MTM price deviations and inflows/ outflows during the two weeks of heightened turbulence in gilt markets. As above, we show our own

(BlackRock) GBP LVNAV, as well as the three GBP LVNAV funds that experienced the sharpest MTM deviations.

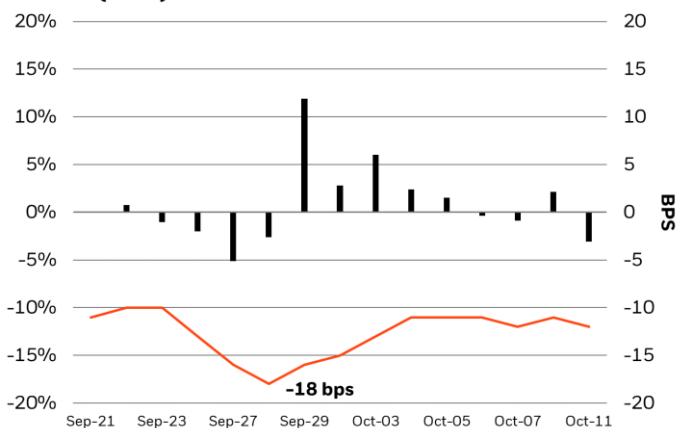
As with March 2020, we saw no evidence of a pricing 'cliff edge' in LVNAV MMFs during this market volatility. Even as some funds experienced significant MTM deviations, sustained across the two-week period of gilt market turbulence, we did not observe this leading to heightened redemptions from funds. *In our own experience*, most of the outflows came from investors with margin needs related to the gilt market volatility itself, not from a wider segment of investors, as we would have expected to see were there to be a pricing cliff edge effect.

Exhibit 5: LVNAV flows v. MTM deviations (September/ October 2022)

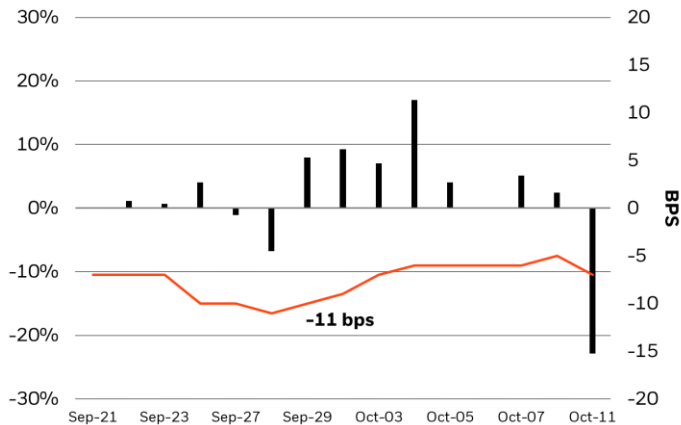
BlackRock LVNAV (GBP)



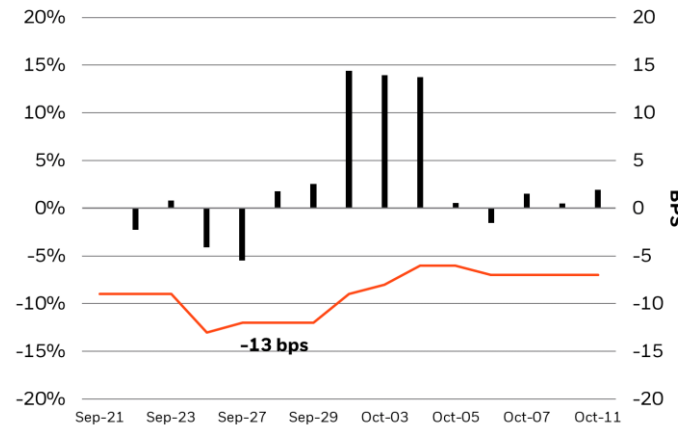
Fund 2 (GBP)



Fund 3 (GBP)



Fund 4 (GBP)



■ Daily Change (lhs) — MTM NAV (rhs)

Source (all charts): Money Fund Analyzer-iMoneyNet/EPFR, BlackRock

In addition to the focus above on specific funds within particular market events over recent years, we have undertaken a far more detailed and granular analysis ([Money Market Fund flows in stressed markets](#)) of NAV deviations and redemptions patterns across a longer time period.

Using daily flow information from January 2020 through end of March 2022 (a time series which covers the majority of the existence of the LVNAV fund structure), we find no empirical evidence of investors redeeming from funds based on underlying NAV deviations. In a detailed regression analysis, less than 1% of the variation in flows can be explained by current or lagged NAV deviations, suggesting that investor inflows and outflows are largely determined by other factors beyond NAV discounts to par value such as yield.

This research lends further statistical support to our observations that there is **no evidence of a non-linearity or pricing cliff edge inherent in LVNAV MMFs**. We conclude that LVNAV MMFs are operating as they are intended to, even in stressed periods.

An operational cliff edge?

While we do not see evidence of a pricing cliff edge in LVNAV MMFs, we do believe it's possible that investors could perceive an operational cliff edge risk – that is, that were an LVNAV's MTM to move outside the 20bps collar, that the MMF may no longer be able to provide intraday liquidity, or perhaps could even need to halt redemptions for a period until they are able to operationalise dealing on the basis of a full MTM price.

Indeed, despite the focus on how LVNAVs price, both the ESMA opinion and the recent ECB paper provide stronger evidence that investors may be incentivised to redeem from a fund if they perceive there is a risk of that fund breaching weekly liquidity (WLA) requirements⁹. This is likely due to the risk (or more accurately, perceived risk) that an MMF which breaches its WLA requirements could have to impose redemption gates or strict liquidity fees and that an investor would be unable to redeem without significant cost, or indeed at all.

No LVNAV has breached the 20bps collar, despite the small number of instances we are aware of (all detailed above) where funds came close to doing so. Therefore, investors have no experience of what a fund breaching the collar might look like. There is a legitimate question as to whether an operational cliff edge might exist if there is a risk that a breach of the collar could interrupt an MMF's ability to price and fund redemptions.

The operational process of striking a price and filling a

redemption or subscription at an MTM price is different to how funds were priced and dealt under the old 'Constant NAV' model. However, it's not entirely clear whether all LVNAVs have the operational capacity to move seamlessly to dealing at an MTM price should they breach the collar.

During the recent UK gilt market turbulence, one LVNAV fund came close to the 20bps collar (as in Exhibit 5, one fund reached a -18bps mark-to-market deviation). However, this is not, in and of itself, a resilience issue. The relevance of the 20bps collar to an LVNAV is merely the point at which it is required to stop doing one thing (dealing at a price rounded to 2 decimal places), and to start doing another (dealing at a full mark-to-market price, rounded to 4 decimal places).

That a particular fund came so close to breaching that threshold is not an indictment of the fund structure, but should rather focus minds on the most important question: how do LVNAV MMFs deal with the operational risk associated with moving from one pricing and dealing process to another?

We believe that it is important for funds to provide sufficient clarity for investors and supervisors as to how (and how often) an LVNAV will be able to deal if it breaches the collar, and whether or not there will be any operational disruptions between a collar breach and being able to resume dealing under an MTM price.

The investor utility of LVNAVs is not easily replaced

LVNAV MMFs are important tools for many investors. Removing them from the regulatory framework (either explicitly, or on a de facto basis) would take away an important liquidity management tool that many investors value.

LVNAV funds are used by a variety of investor types, though the majority of investors are institutional, and there are a number of different reasons that the ability to round to 1.00 appeals.

The value of the 'stable NAV' (either the true stable NAV or the LVNAV's reasonable approximation) to investors is that they do not need to book a capital gain or loss that the MMF itself has not realised. While the MTM value of a particular security can deviate from par at any given point, it will mature at par value (unless there is a default). The ability of the LVNAV to round off some of the unrealised volatility, or for CNAV funds to not pass any MTM volatility at all into the share price, means that investors have a far easier time treating these types of funds as 'cash and cash equivalent' for accounting purposes which is particularly important for corporate investors.

There is no central accounting authority that can declare that all VNAV MMFs across Europe be deemed cash & cash equivalent from an accounting perspective. Therefore, the features that have been most important in this determination have needed to be built into the fund structure itself, namely; the ability, in most market conditions, to deal at a share price that removes some of the unrealised capital gains/ losses in the underlying portfolio.

MMF users invested significant resources in accepting LVNAV MMFs in 2018-19: conducting due diligence on new structures, updating investment guidelines, educating risk and investment governance bodies, and working with accountants and auditors to maintain cash & cash equivalent status in the transition from CNAV funds to LVNAVs. Without clear evidence that the fund structures themselves pose inherent financial stability risk, it would be unreasonable to ask users to redouble these efforts and expenditures.

While some LVNAV investors may be able to get comfortable with VNAV MMFs as cash & cash equivalent, it is entirely possible that many will not. Losing these investors will negatively impact the scale and liquidity in MMFs overall, further reducing their utility even for those investors able to migrate to VNAV. Those who would not switch to VNAV MMFs might look for other, likely less transparent, cash management tools. Some of these could be less liquid than MMFs (e.g. direct investment in short-term markets), potentially creating new risks.

Liquidity buffers

Liquidity buffers are one of the most important features of MMFs. The purpose of these buffers is to ensure that MMFs have a sufficient amount of cash on hand any given day (DLA) to ensure that they can meet even significant redemptions, and to ensure that portfolio contains enough short-dated assets (WLA) that it can organically replenish its supply of cash on hand over a multiday period. An MMF would only be forced to sell an asset in its portfolio if it were unable to fund redemptions from cash on hand.

These buffers underpinned the resilience of European MMFs during the COVID-19 related market disruption. Indeed, in March 2020, even though redemptions were significant, they were largely able to be met by funds' regulatory liquid asset minimums as prescribed by the MMFR.

In **Exhibits 6-8**, we detail the actual outflows (net redemptions) experienced each day by both BlackRock LVNAVs and our other funds in March 2020, set against the

amount of DLA and WLA each fund was holding at the time. We have chosen to show the industry LVNAV funds that witnessed the most significant redemptions. We observed no European short-term MMF, either LVNAV or Short Term VNAV (granular daily data on flows and portfolio composition of Standard VNAV MMFs is not readily available) experience redemptions in excess of their DLA levels, which would have required them to sell assets to meet outflows.

While we did not observe any instance of daily redemptions exceeding the DLA that short-term MMFs were holding, we did see many MMFs seeking to raise their levels of WLA through asset sales in March 2020.

In normal circumstances, the role of WLA is to ensure MMF portfolios are well-positioned to organically replenish cash buffers (DLA). However, in March 2020, the move to increase WLA was, in many instances, an effort to ensure that WLA remained well above minimum levels to reassure investors that there was no risk of funds needing to impose redemption gates or harsh liquidity fees.

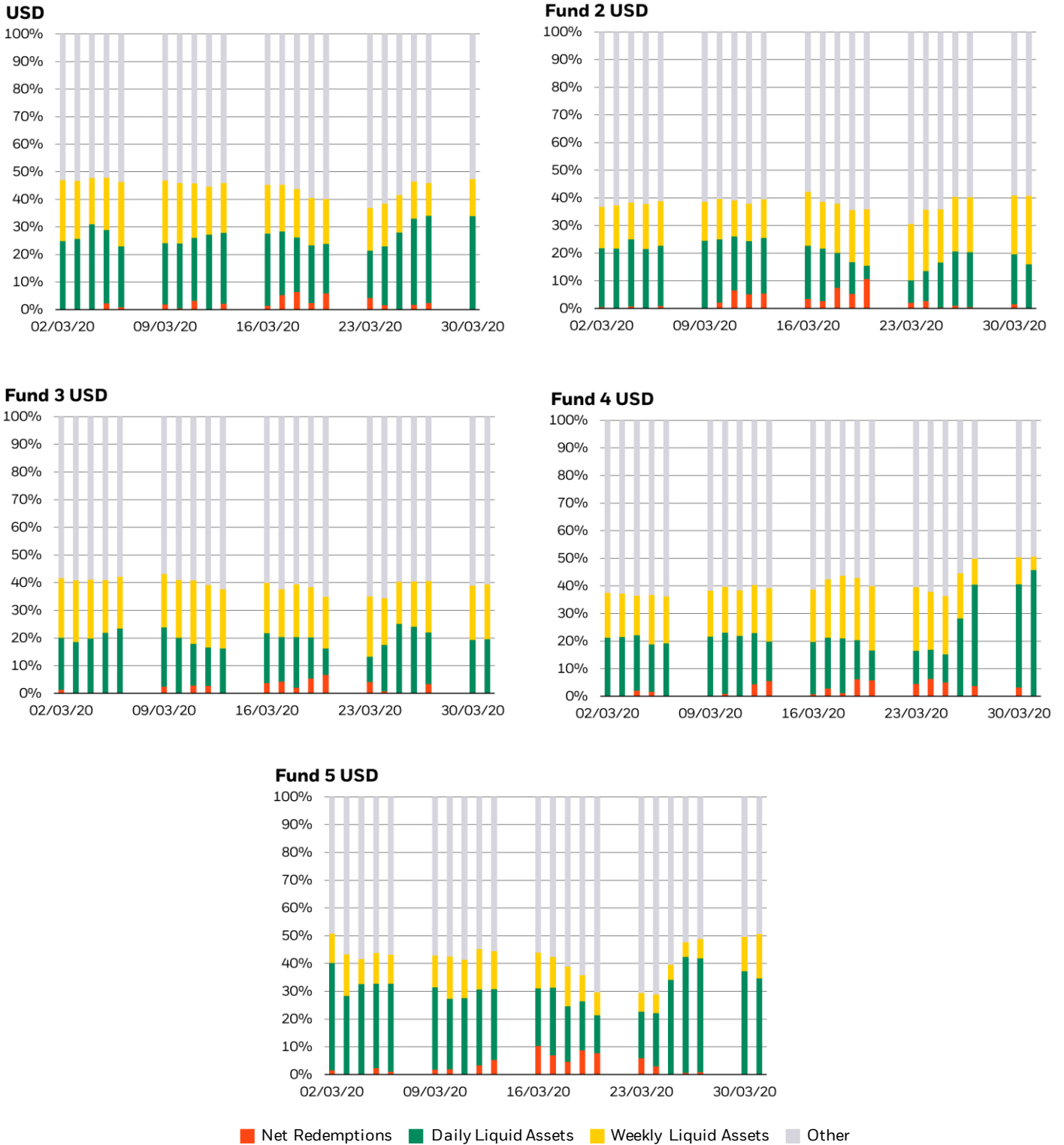
This supports the conclusion that a wide range of policymakers and the industry have come to support, which is the need to address potential threshold effects tied to breaches of WLA minimums. This can even take the form of supplementary supervisory guidance which should make clear that the imposition of a liquidity management tool (likely a liquidity fee in the case of MMFs) is not automatic in the case of a breach, only if the situation warrants it (we believe the Fund Board is best placed to make this decision). Furthermore, guidance should specify that gating is an option of last resort.

Calibration of liquidity buffers

In March 2020, the MMFR underwent a real live 'stress test' in the form of a market-wide liquidity strain. While most European MMFs had to deal with extremely challenging market conditions, no fund (where we have data in the short-term MMF market) was unable to meet investor redemptions (see **Exhibits 1-3**).

The direct evidence indicates that the MMFR has been largely effective in ensuring that sufficient liquidity is available through DLA requirements; redemption levels in March 2020 show that the existing minimum DLA requirement of 10% was sufficient to meet outflow pressures during the strain. However, given that available cash is the first test of an MMF's ability to withstand a sudden demand for liquidity we do think that minimum DLA could be raised to 15%, which would further bolster MMFs' resilience if such a market scenario were to occur in future.

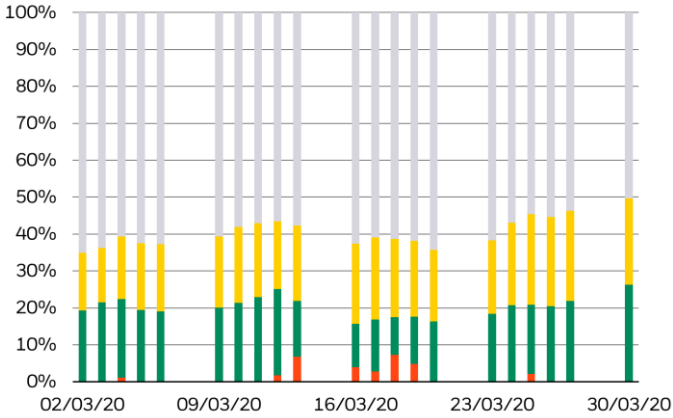
Exhibit 6: Outflows vs. Liquid assets – USD LVNAVs March 2020



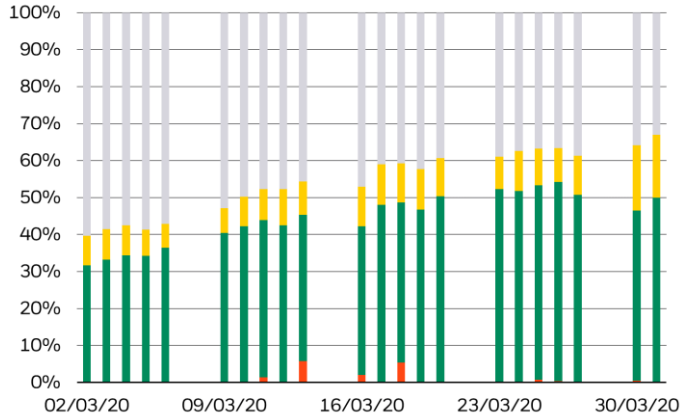
Source (all charts): Money Fund Analyzer-iMoneyNet/EPFR, BlackRock

Exhibit 7: Outflows vs. Liquid assets – EUR LVNAV March 2020

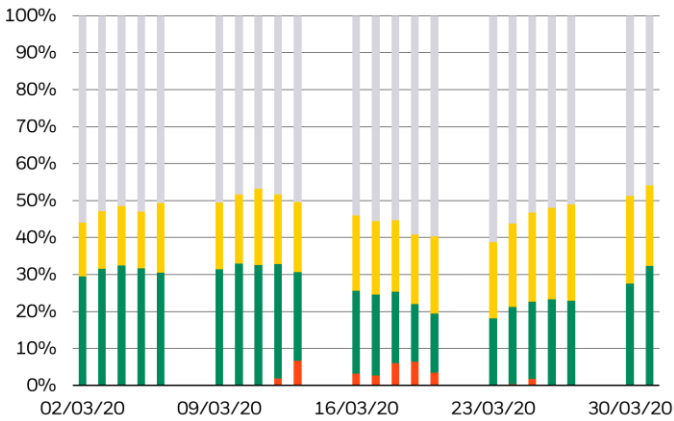
EUR



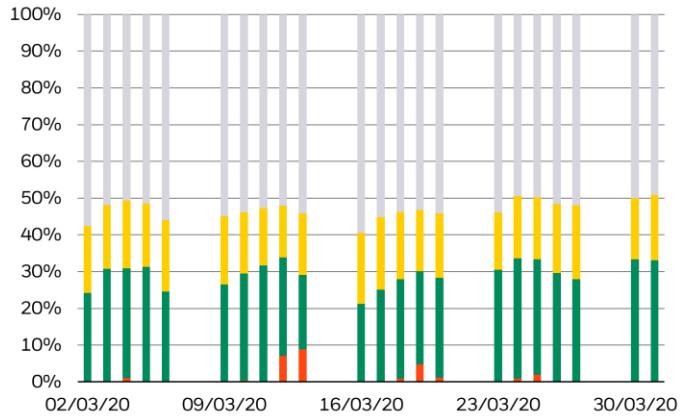
Fund 2 EUR



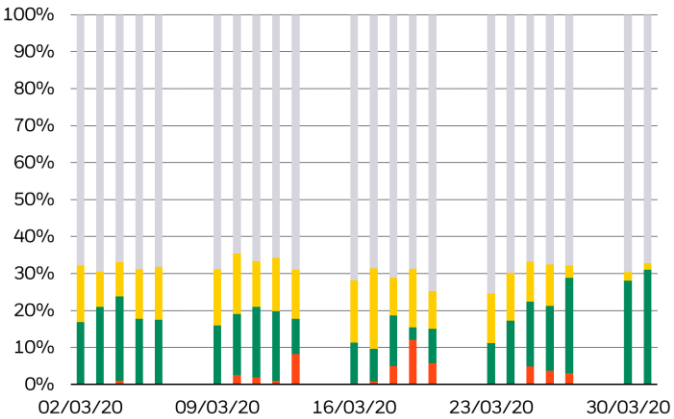
Fund 3 EUR



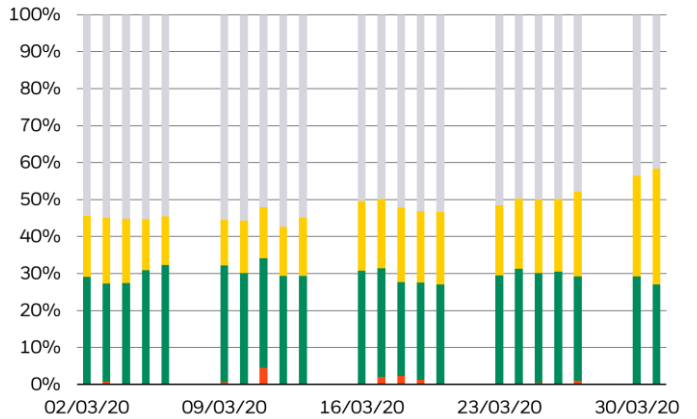
Fund 4 EUR



Fund 5 EUR



Fund 6 EUR

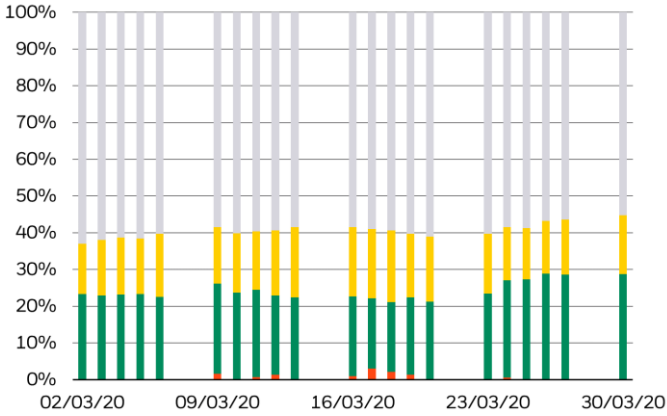


Net Redemptions Daily Liquid Assets Weekly Liquid Assets Other

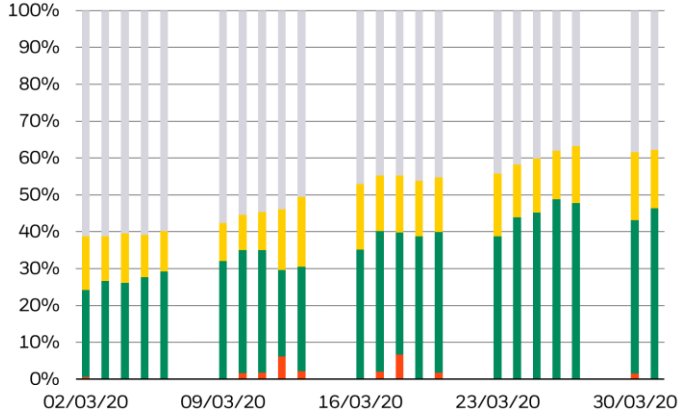
Source (all charts): Money Fund Analyzer-iMoneyNet/EPFR, BlackRock

Exhibit 8: Outflows vs. Liquid assets – GBP LVNAV March 2020

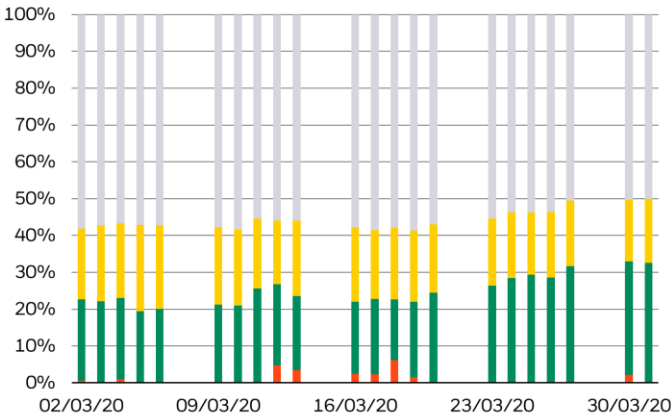
GBP



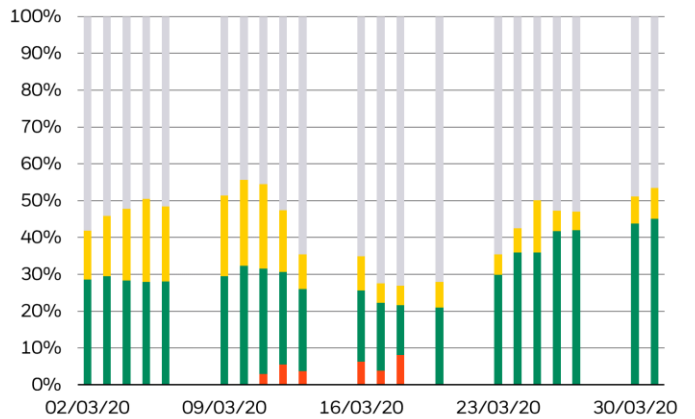
Fund 2 GBP



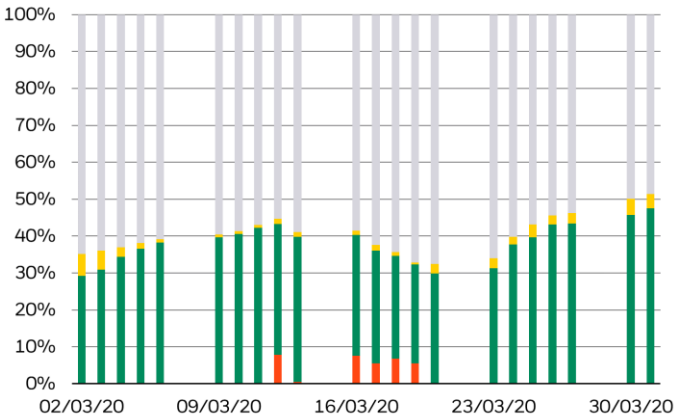
Fund 3 GBP



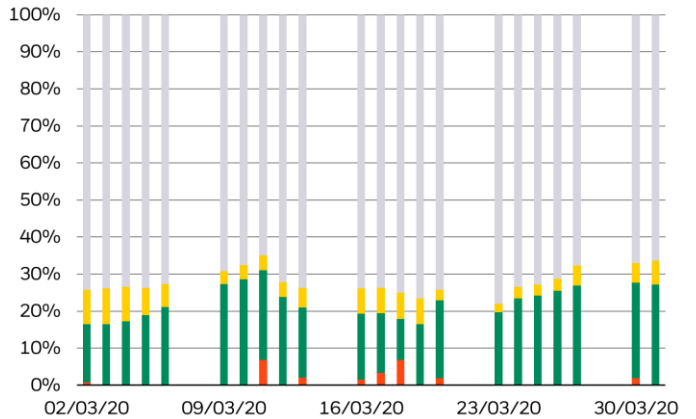
Fund 4 GBP



Fund 5 GBP



Fund 6 GBP



■ Net Redemptions
 ■ Daily Liquid Assets
 ■ Weekly Liquid Assets
 ■ Other

Source (all charts): Money Fund Analyzer-iMoneyNet/EPFR, BlackRock

Cash is key for MMFs

MMFs must place all cash positions with a counterparty overnight. This is done either on an *unsecured* basis (via a deposit with a credit institution), or on a *secured* basis (via a reverse repo, again normally with a bank counterparty, typically with high quality government debt securities taken back as collateral).

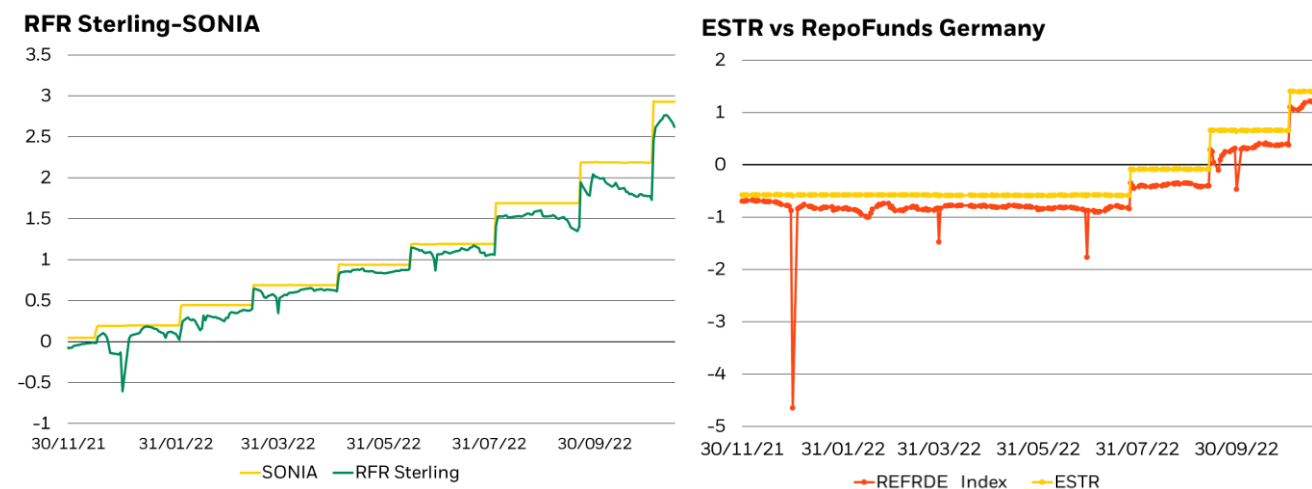
Both of these methods of placing cash overnight are ultimately contingent on bank counterparties' willingness and ability to receive cash. Ultra-short duration deposits are invariably the least attractive form of funding for banks due to regulation (Basel III) aiming to ensure they have liquidity and stability for reasonable periods and can avoid default if short term issues arise. Quarter-ends and especially year-ends become even more punitive as most financial institutions report balance sheet (risk) positioning that drive calculations that can lead to higher taxes (levies) or capital requirements.

Short term depositors are therefore disincentivised (through expensive pricing), capacity constrained or outright refused access to a bank's balance sheet as these overnight deposits redefine a bank's funding profile and lead to higher costs and capital requests.

Overnight reverse repo is similar in that the funding is still overnight but with the additional constraint of being collateralised with High-Quality Liquid Assets (HQLA) at a time when banks would prefer to keep HQLA on balance sheet for capital purposes.

We can illustrate the impact on cash investors in a few ways. In **Exhibit 9**, we show the pricing levels for overnight reverse repo levels in Sterling and Euro (German collateral, though this is a reasonable proxy for rates across the wider market). Throughout the year, there is a cost for reverse repo above the benchmark money market rates (SONIA and ESTR, respectively), but in addition, we see regular price dislocations around quarter-end dates, and a particularly pronounced drop at year-end. In each case, rates normalise quickly once the quarter-/ year-end reporting date has passed.

Exhibit 9: Year-End Repo Rates (2021-2022)



Source (all charts): Bloomberg, BlackRock

We believe that this level of cash provisioning (a 15% minimum requirement) would be manageable for MMFs to place overnight in all currencies, within the existing market structure.

But requiring MMFs to hold cash above and beyond this level would be challenging and could create new risks when funds may not be able to place cash at these levels on dates like quarter- or year-end. Eliminating this risk would likely require deeper public intervention in Repo markets, for example, a facility similar to the US Federal Reserve's (Fed)

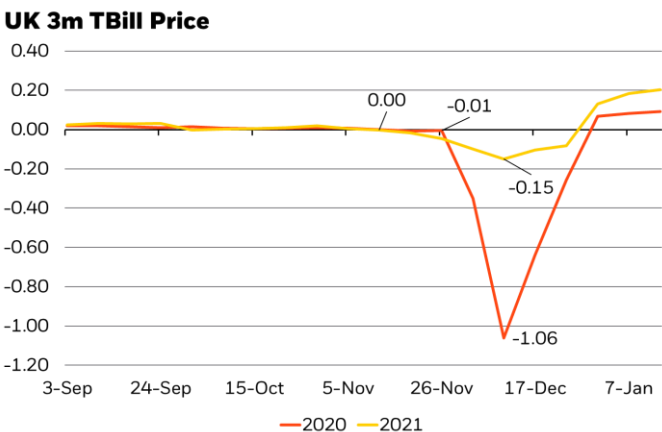
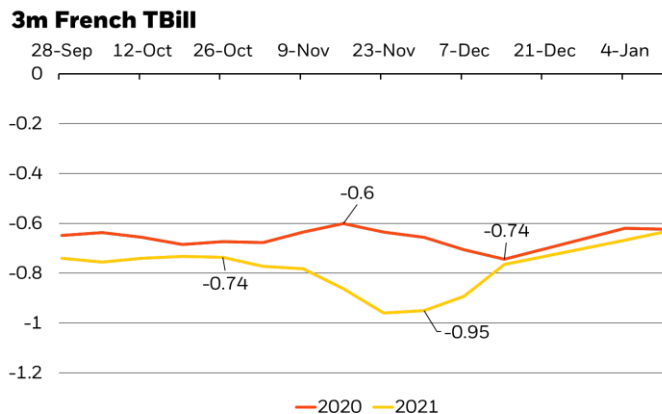
Reverse Repurchase Program (RRP). In the US, the Fed acts as the 'cash taker' of last resort by allowing eligible non-bank counterparties, including US MMFs, to place cash with the Fed through a Reverse Repo. Without a similar market structural adaptation in Euro or Sterling markets, requiring MMFs to hold levels of cash that they would routinely struggle to place around quarter-ends and year-end would introduce vulnerabilities at regular intervals in exchange for theoretical resilience to a redemption scenario even greater than that experienced in March 2020.

Composition of liquidity buffers

The ESRB and ECB opinions each proposed that non-government debt MMFs (e.g. LVNAVs and VNAVs) be required to hold minimum buffers of government debt in addition to their levels of DLA and WLA. The rationale for these proposed additional buffers would be that, in times of market stress, MMFs would be able to sell government debt, which normally is more liquid than CP or CDs during market turbulence.

The fact that government debt can be an important liquidity management tool in certain circumstances is also part of the reason why it can experience regular intervals of price volatility. **Exhibit 10** shows the yield of French and UK 3m T-Bills around Q4 and over year-end in 2020 and 2021. In each case, we see yields drop (in some cases dramatically) and prices of government debt rise as the market looks to position itself across year end in November and early December. This heavy premium for high quality government debt reflects the scarcity of HQLA and broader challenges placing cash over year end. In these periods, primary issuance of French and UK T-Bills are typically oversubscribed by 2-3 times and aggressive bidding takes place to secure supply.

Exhibit 10: Year-End T-Bill Rates (2021-2022)



Source: Bloomberg, BlackRock

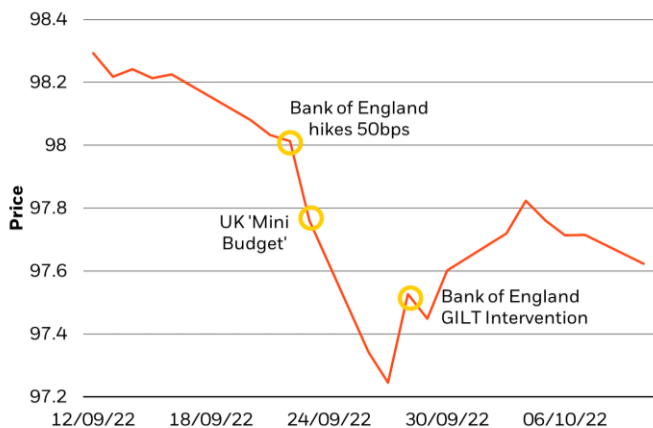
If an MMF were to be a forced buyer of these relatively short term government holdings in November or December, the price (MTM) of these securities is likely to be much lower in January once the supply/demand mismatch for these assets over year end has passed. This exposes the fund to increased price volatility which the manager would be able to avoid were it not potentially for a regulatory requirement to hold a fixed portion of the portfolio in government debt at all times.

The UK Gilt market turbulence and MMFs: a closer look

The market turbulence in the UK around the UK Government's "mini-budget" sent prices falling and yields on long-dated gilts soaring.

The sharp and sudden drop in prices impacted many pension funds who use liability-driven investment (LDI) strategies, which often employ leveraging long-dated gilt positions to help hedge risks, while meeting future liabilities. As prices fell, so did the value of these funds' assets, thereby increasing their leverage, and in turn, requiring them to post increased margin.

Exhibit 11: Price Volatility in 10m Gilts Around the 'Mini-Budget' Announcement



Source: Bloomberg, BlackRock

MMFs were also affected: the price volatility also impacted short-term markets (see **Exhibit 11**) to some extent, and a number of LVNAV MMFs (LVNAV represents the overwhelming majority – 90+% – of the GBP MMF landscape) saw material mark-to-market NAV deviations well in excess of those seen in March 2020, and a number saw significant flows from affected investors (both outflows in the early stages of the volatility as pension funds withdrew MMF holdings to raise cash for margin needs, then in many cases, subsequent significant inflows as those same investors built up large cash positions).

As we lay out in **Exhibit 5**, while some LVNAV's saw notable deviations, redemption patterns did not suggest that investors perceived a 'pricing cliff edge'. In our own experience, outflows were concentrated amongst investors most affected by the market turbulence, and the rest of the investor segments saw no unusual redemptions. Were there to be a 'pricing cliff edge', this market episode would perhaps have been the most obvious for that risk to manifest, given the instances of notable price deviations, and asymmetric liquidity pressures across different types of investors.

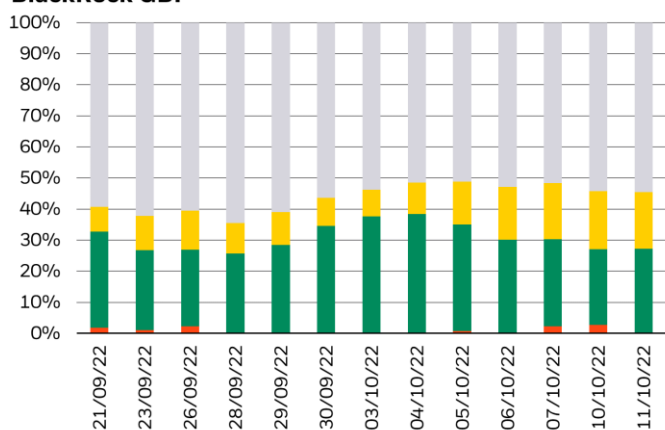
Despite the (in certain instances, significant) outflow pressures on MMFs seen during the gilt market turbulence MMFs were able to meet all redemptions easily due to the high levels of liquidity (in particular, daily liquid assets)

that many were holding given the rate increase environment, where prudent portfolio risk management had led MMFs to increase liquidity and shorten duration.

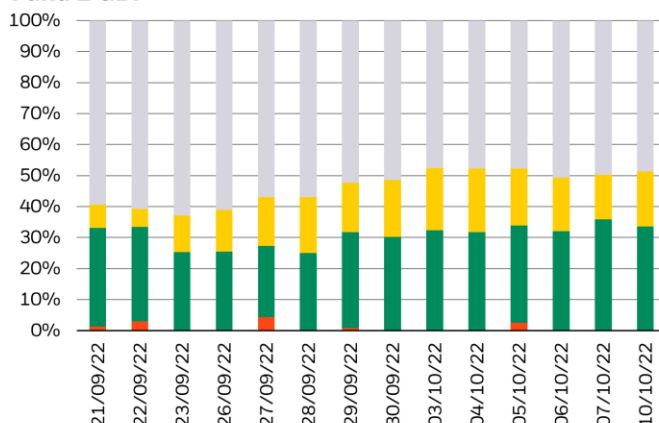
In **Exhibit 12**, we outline the instances of daily net redemptions during the mini-budget gilt market turbulence versus the liquidity provisioning (the levels of cash/ daily liquid assets as well as weekly liquid assets in funds' portfolios) of four GBP LVNAV funds (our own BlackRock fund, as well as the three peer LVNAV funds which saw the most notable outflow pressures). The levels of liquidity provisioning in these funds underscores how well positioned they were – regardless of mark-to-market price volatility – to meet redemptions and still remain highly liquid during such an acute episode of market stress.

Exhibit 12: Redemptions v. liquidity provisioning in GBP LVNAV MMFs

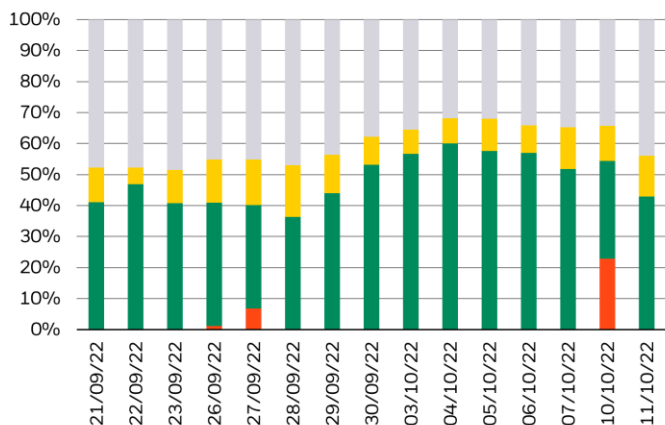
BlackRock GBP



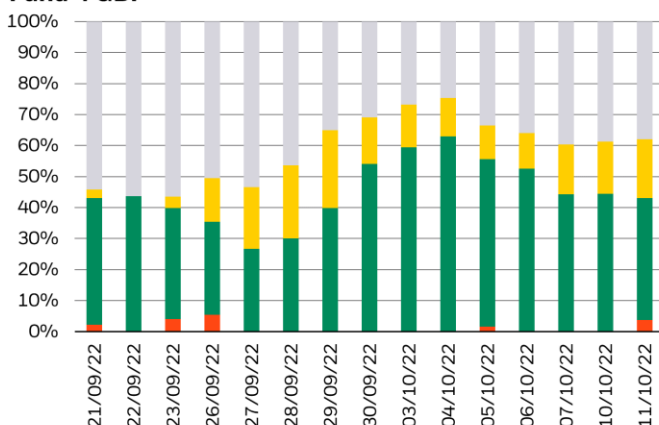
Fund 2 GBP



Fund 3 GBP



Fund 4 GBP



Legend: Other Short Term Money Market Instruments (Grey), Weekly Liquid Assets (Yellow), Daily Liquid Assets (Green), Net Redemptions (Red)

Source (all charts): Money Fund Analyzer-iMoneyNet/EPFR, BlackRock

The gilt market strains also offer two other important observations relevant to the MMF reform debate:

- The first pertains to the discussion around minimum public debt quotas for credit MMFs. Aside from the obvious observation that government debt is clearly not immune to episodes of price volatility, the more important point from a financial stability perspective could be about concentration risk. That pension funds made up such a significant part of the investor base for long-dated gilts undoubtedly meant that portion of the UK yield curve was particularly vulnerable to a shock that affected that particular group of investors. There is an important lesson to be drawn in considering the possibility of a public debt quota for MMFs: a scarcity of short-dated public debt, especially in EUR and GBP, could create the risk of MMFs become an overly-concentrated investor base in these securities. For example, we calculate that in order to meet the 40% public debt quota mooted by the FCA, Bank of England and HMT in their 2022 MMF reform discussion paper¹⁰, MMFs would essentially need to be the sole holders of all outstanding UK T-Bills and all outstanding gilts with one-year residual maturity.
- The second observation relates to the importance of MMF investors' margin and collateral needs in driving outflows during a period of market stress. In March of 2020, a meaningful portion of outflows in EUR LVNAVs came from users who needed to raise cash for margin purposes. As we outline above, nearly all of the outflow pressures from MMFs related to the gilt market turbulence came from investors who faced margin pressures as a result. Building a system where MMF shares can be more easily posted directly as collateral for margin, rather than forcing a user to redeem shares for cash (which not only create an outflow pressure on an MMF, but often create a pressure on the other counterparty to find somewhere to place the cash) could go a long way toward alleviating unnecessary stresses on MMFs as a spillover effect of market volatility.

End notes

1. <https://www.fsb.org/wp-content/uploads/P111021-2.pdf>
2. https://www.ecb.europa.eu/pub/pdf/other/ecb_eurosystemreplyesmaconsultationeu_moneymarketfunds~27c35301db.en.pdf
3. <https://www.esrb.europa.eu/news/pr/date/2022/html/esrb.pr.220125~32ad91c140.en.html>
4. https://www.esma.europa.eu/sites/default/files/library/esma34-49-437_finalreportmmfreview.pdf
5. Both recommendations ask for the removal of the ability of an LVNAV to deal at a rounded (2 decimal place) share price, effectively forcing them to deal at all times at the MTM (4 decimal place rounded) NAV. This is the same pricing/dealing structure as a VNAV MMF, effectively converting the LVNAV into another VNAV category under the framework.
6. https://www.ecb.europa.eu/pub/pdf/scpwps/ecb_wp2737~6523cfa88a.en.pdf?51fc8220761bf1700bd4e0d419fde3ea
7. The report's data set covered January 2019-May 2020, and concluded that, in normal market conditions MTM deviations in LVNAV funds did not accelerate redemptions. Where there was market turbulence, MTM deviations of >5bps could lead to 0.9-1.5% higher outflows, deviations of >10bps could lead to 1.5-2.4% higher outflows.
8. Crane data cites non-financial corporate Commercial Paper as representing just over 2% of exposures in Q1 2020
9. The ESMA opinion notes that MMFs with lower WLA levels in March 2020 tended to see higher outflows than those with higher WLA levels (p. 14 – point 16); according to ESMA, this “can be interpreted as evidence that institutional investors redeem from MMFs to avoid being subject to fees and gates.” The recent ECB research paper (No. 2737/ October 2022) comes to the same conclusion, noting that findings “suggest(ing) that investors are sensitive to a possible breach of liquidity thresholds... aggravated by the fact that corrective measures (e.g. fees
10. <https://www.fca.org.uk/publication/discussion/dp22-1.pdf>

Increasingly, this is technologically feasible today, however, there are regulatory barriers that should be carefully considered.

It should be emphasised that MMFs (in particular, LVNAV MMFs, which make up the majority of the GBP market) played an important role in underpinning financial stability during the September–October 2022 gilt market turbulence. In the early days of the turbulence, these funds were well positioned to provide the liquidity needed by many investors, and as the volatility went on, MMFs became extremely important tools for these investors to store the liquidity positions they built up (many banks would have found it difficult – or at least unattractive from a capital perspective – to absorb this excess cash).

Conclusion

MMFs – and in particular, LVNAV MMFs – are important cash and liquidity management tools for many European and global investors. Even during times of significant market turbulence (for example, in March 2020 and more recently in September/ October 2022 in UK gilt markets), these MMFs have performed well. The notable outflows that many LVNAV MMFs managed at times during these market episodes are not a sign of a lack of resilience, but rather, evidence of a high degree of resilience, as they were able to continuously provide liquidity to investors who needed it.

While we see the case for some targeted technical reforms that can further enhance the resilience of European MMFs, even on close scrutiny, we see no evidence of significant design flaws in the LVNAV structure. We believe that European MMFs can be made stronger with: (1) manageable increases to the daily liquid asset requirements for all daily-dealing non-government MMFs, (2) improved transparency and predictability of outcomes in MMFs' liquidity management toolkits, and (3) clearer procedures for pricing and dealing when an LVNAV fund breaches the 20bps collar to underpin the continued operational resilience of these funds.

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